

THEMIS observations of directly-driven Pi2 pulsations

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The THEMIS tail seasons have provided an unprecedented opportunity to examine the causal relationship between midtail plasma flows and low latitude Pi2 pulsations. We present several events where multiple THEMIS spacecraft observed magnetotail flow bursts which were followed up to several minutes later by ground Pi2 pulsations. We find good agreement with the waveforms of the flow bursts and flank Pi2, in agreement with the hypothesis that Pi2 at low-latitude on the flank are directly-driven by periodic variations in the flow bursts. For at least 1 event we are able to follow the Pi2 impulses from the periodic flow bursts on the nightside, to ground Pi2 at the flanks, and finally through the dayside magnetosphere as observed by GOES. We further place the physical mechanism generating these Pi2 into the context of substorm onset. We conclude by discussing the sequence and coupling of events that are necessary to explain the correlation, and the constraints this places on models of transient magnetospheric transport.